

**GULF COAST TO
CALIFORNIA PIPELINE
FEASIBILITY STUDY**

DRAFT STAFF REPORT

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Introduction

Assembly Bill No. 2098 by Migden directed the State Energy and Resources Conservation and Development Commission, in consultation with the State Fire Marshal, to study the feasibility of financing, constructing, and maintaining a new pipeline, or utilizing or expanding the capacity of existing pipelines, to transport motor vehicle fuel or its components from the Gulf Coast to California.

The California Energy Commission (Energy Commission) hired Interliance to assist with the analysis. Interliance's report, *Gulf Coast to California Pipeline Feasibility Study*, is currently available for review.

Summary of Contractor Report

The following section contains references and excerpts from the Interliance report that are intended to summarize the primary elements of their study. The reader is encouraged to review the actual report in the event that specific details, not captured in this document, may be relevant to various issues raised in this Staff report.

Pipeline Fundamentals

Petroleum product pipelines are the most economical means of transporting gasoline and other motor fuels from points of production or major supply regions to distant areas that require transportation fuels to meet demand.

The permitting phase of pipeline projects can be extensive and take years to complete. As many as 2,000 to 3,000 different permits could be required for a major pipeline project.

Costs for petroleum product pipelines vary based on their size (overall length and pipe diameter), difficulty of excavation (flat terrain versus mountain passes), land acquisition costs for their right-of-way, and potential litigation fees. Based on historical averages, labor usually accounts for 40 percent of the project's cost, materials for construction at 23 percent, acquisition of land at 10 percent, and the remaining 27 percent on engineering and overhead. Average cost for 115 land projects surveyed for the 1999 to 2000 period totaled a little more than \$1.5 million per mile.

Petroleum pipelines are capital intensive projects that normally require agreements in advance with a number of shippers to ensure that the pipeline will have an adequate revenue stream over a 10 to 20 year period to pay for the construction and turn a profit. A tariff is charged shippers on pipelines to generate revenue for the pipeline operators that will be sufficient to pay off the loans, cover operation and maintenance expenses, and provide an adequate return on the investment (normally about 10 to 15 percent).

Southwest Petroleum Product Pipeline System Overview

The Southwestern United States (California, Nevada and Arizona) contains a number of petroleum product pipelines. The largest system is the one owned and operated by Kinder Morgan (KM), consisting of over 3,400 miles of pipeline varying in diameter from 4 to 24 inches. KM is a "common carrier" company that does not own any of the products it ships through its system, rather it charges a fee (tariff) to operate the pipeline.

The KM pipeline system delivers products from refineries and import facilities to 14 KM distribution terminals, third-party terminals, several military installations, commercial airports, and other interconnecting pipelines. Tanker trucks are then used by companies to transport the gasoline and diesel fuel from these terminals to service stations and truck stops. The KM system also transports products to Nevada and Arizona as well as California. At the same time, Phoenix,

Arizona, is currently supplied by KM from both the California refineries and from product originating in El Paso, Texas. Currently there is no connection from Southern Texas to El Paso.

The Longhorn Pipeline project is a new pipeline that is expected to be operational during the summer of 2002. This system originates in the refinery region of Houston and terminates in Western Texas (El Paso). Once operational, this distribution system will enable refiners in Texas to ship gasoline and diesel fuel to El Paso at an estimated cost (tariff) of 4 to 5 cents per gallon. Initial capacity of this pipeline should be a little more than 70 thousand barrels per day (TBD), with an eventual capacity of over 225 thousand barrels per day.

Petroleum Product Pipeline System Constraints and Outlook

The study examined petroleum product supply/demand balances for the Southwest through 2010. Key points are that California is a net exporter of petroleum products, supplying the majority of gasoline and distillates (diesel and jet fuel) to Nevada and Arizona. As demand continues to grow in these three states, most of this additional growth will have to be satisfied by a combination of new imports into California and/or expansion of the pipeline and shipments from Texas to Arizona.

The 2000 California product balance can be summarized as follows. California refineries produced an average of 1,584 TBD of gasoline and distillate (diesel and jet fuel). This production was supplemented with 138 TBD of marine imports, both foreign and domestic, resulting in a total product supply of 1,722 TBD. California consumption was approximately 1,442 TBD, with the balance of 280 TBD being exported out of state. California exports consisted of 32 TBD to Oregon by tanker, 146 TBD to Nevada by pipeline, 126 TBD to Arizona by pipeline and 9 TBD by truck to various out-of-state locations.

There are several other noteworthy items for the year 2000 balance:

- Nevada's 2000 demand of approximately 147 TBD was supplied almost entirely by imports from California via KM pipelines to Reno and Las Vegas.
- Arizona's 2000 demand of approximately 248 TBD was supplied primarily by KM's western system (126 TBD) and KM's eastern system (87 TBD) from El Paso, Texas. The balance of the supply is trucked in from surrounding states.
- California supplied approximately 271 TBD of petroleum products to Arizona and Las Vegas during 2000. Some portion of this volume could be retained for use in California if capacity to supply these other markets from the east were expanded and supply was available.

For projections beyond 2000, the following assumptions were made:

- U.S. Census Bureau growth rates are used for population growth and product demand.
- California refinery production will creep or expand 1.0% per year.
- Refined product demand in Arizona and Nevada will increase at the same rate as population growth.
- Refined product demand outlook for California was obtained by using the forecast derived by the California Energy Commission.
- No new refineries will be built or shut down in California, Nevada, Arizona, or New Mexico.
- New Mexico will continue to be an exporter to Arizona of approximately 18.8 TBD.

- The potential decrease of production volume, estimated at approximately 5%, due to replacement of methyl tertiary butyl ether (MTBE) with ethanol is included in current projections.

Based on the previous assumptions, California refineries are not expected to be able to supply both local consumption and increased exports to Nevada and Arizona for the next 10 years.

In addition, the pipeline capacity of specific segments is nearing or will be at maximum capacity by 2010. This means that additional expansion projects would have to be undertaken in order that Arizona and Nevada continue receiving adequate volumes of petroleum products by pipeline, rather than the more costly transportation method of trucking.

Conceptual Petroleum Product Pipeline Operation

In order for the Gulf Coast to California pipeline to be properly sized, the purpose of the project must first be established. The California Energy Commission (CEC) established two potential operational scenarios for this pipeline:

- Operate as “the” strategic fuel reserve (SFR) currently under study by the CEC
- Operate as a fill line for an SFR storage facility to be established in California

Conceptual Petroleum Product Pipeline – Operate As Strategic Fuel Reserve

The main problem with this concept is the very limited use (4 weeks per year) of the pipeline. Pipelines are normally designed to operate continuously and are shut down only for maintenance activities. Interface mixing and the product shelf life are major concerns or constraints for this alternative.

Operating the pipeline as a Strategic Fuel Reserve would be less efficient than a reserve that was operated from a number of different storage tanks located throughout the State.

Conceptual Petroleum Product Pipeline – Operate To Fill A Strategic Fuel Reserve

In this scenario, the conceptual pipeline would be used to refill a permanent SFR in Southern California after a refinery-upset condition. Because the design basis of the SFR is 4 million barrels per year (2 million per event with two events per year), the required flow rate of the pipeline would be only 11 TBD if operated on a continuous basis.

Conceptual Petroleum Product Pipeline – Operational Design Conclusion

Based on the above analysis, a 24-inch-diameter pipeline will be required if the pipeline is to operate as the SFR and a 12-inch-diameter pipeline is required if the conceptual line is to be used as a fill line for a permanent SFR to be constructed in Southern California.

Conceptual Petroleum Product Pipeline Cost and Schedule

The total cost for installation of the conceptual pipeline is estimated at \$806 million for a 12-inch pipeline and \$1.6 billion for a 24-inch pipeline. This is a conceptual “order-of-magnitude” estimate and is based on historical cost data. The major cost components are as follows:

Component	Costs		Assumption
	12-inch	24-inch	
Main Pipeline	\$524 million		Conventional trenching installation of 1,415 miles of 12-inch-outside-diameter steel pipe at an average of \$370,000/mile
		\$1,132 million	Conventional trenching installation of 1,415 miles of 24-inch-outside-diameter steel pipe at an average of \$800,000/mile
Road and Water-way Crossings	\$50 million	\$50 million	50 directional drills underneath major highways and waterways at \$1,000,000 each
Pump Stations	\$32 million		Nine pump stations rated at 1,750 hp each at \$2,050 per hp
		\$18 million	Three pump stations rated at 5,000 hp each at \$1,200 per hp
Metering and Control	\$14 million	\$6 million	Telecommunications and SCADA equipment at each pump station and the end point at \$1.4 million for each installation
Contingency	\$186 million	\$360 million	A 30% contingency based on the conceptual nature of the project design
Total:	\$806 million	\$1,566 million	

The conceptual pipeline cost estimate is a construction estimate for feasibility purposes only. It does not account for the costs of prolonged construction delays, which are often encountered during a project of this magnitude due to landowner disputes, challenges from special interest groups, or unanticipated cultural and environmental findings during construction.

A project of this size is estimated to require 4 years to complete following conceptual approval and initial financial backing. The estimated duration of the major phases of the project is as follows:

Phase	Duration	Explanation
Engineering and Design	6 months	Specific pipeline surveys and design information must be completed to provide input into the permitting process.
Permitting and Initial Material Procurement	18 months	The lengthy process of preparing, submitting, addressing questions and concerns, and obtaining applicable regulatory agency approvals. Orders for pipeline materials would be placed once a permit for a specific section is obtained.
Construction and Testing	24 months	This accounts for long lead-time material, primarily pipe. Several segments of the pipeline would be laid concurrently as material is available.
Total	4 years	

The above schedule is a construction estimate for feasibility purposes only. It does not account for prolonged delays during the permitting and construction phases, which are often encountered during a project of this magnitude due to landowner disputes, challenges from special interest groups, or unanticipated cultural and environmental findings.

Staff Observations

The following comments and observations reflect the California Energy Commission Staff's perspectives on Interlance's Pipeline Study. In addition, a number of other topics are examined to augment and compliment the Interlance Study to completely address the various issued raised by the AB 2098 legislation.

Operating the Conceptual Pipeline as a Strategic Fuel Reserve

Staff agrees with the conclusions of Interlance that construction of a conceptual pipeline to be operated as a strategic fuel reserve would be impractical and costly. Intermittent operation of such a pipeline would create a number of logistical and product quality problems that would preclude the use of such a pipeline in this manner.

Operating the Conceptual Pipeline as a Fill Line for a Strategic Fuel Reserve

The main problem with this approach is that the cost to construct and operate a pipeline solely to fill the SFR would far outweigh the cost to transport 4 million barrels of gasoline via marine vessel from Texas. The cost of the smaller pipeline alone would exceed \$800 million, whereas the transportation cost via US Jones Act tankers would only amount to \$17 to \$42 million (based on a recent historical shipping rate range of 10 to 25 cents per gallon). In addition, there would be the same logistical and product quality problems created by the intermittent operation of this pipeline.

Conclusion: Operational difficulties preclude the feasibility of using this conceptual pipeline as a strategic fuel reserve.

Conceptual Pipeline Between the U.S. Gulf Coast and California

Although Staff believes that a conceptual pipeline should not be constructed if it were intended to be operated as a strategic fuel reserve, the potential merits of a pipeline between Texas and California were examined to determine if such a pipeline could be a viable source of additional gasoline supplies for the State.

Three primary factors need to be evaluated to determine if the construction and operation of such a pipeline is a feasible and economically viable project. The first factor is that there needs to be a constant and sizable increased demand for petroleum products in California that will not be satiated with in-state production. The second factor is that there needs to be an adequate supply potential of complying petroleum products located at the originating point for the pipeline. The third factor is that the tariff structure of the new pipeline must be lower than the cost of alternative means of transportation, namely marine vessel freight rates between Texas and California.

Growing California Demand For Gasoline Imports

California's demand for gasoline is expected to grow at an annual rate of 1.6 percent over the next 10 years. Over the same period of time, California refinery production output is expected to continue increasing at a rate less than that of the forecasted demand. More importantly, gasoline production from refineries located in California is expected to decline by 5 percent as a direct consequence of the phaseout of MTBE. The combination of increasing demand and decreased local supplies means that California will increase the quantity of gasoline and blending component imports by 56 thousand barrels per day to balance out supply to meet the anticipated level of demand. It is estimated that California will become a continuous net importer of nearly 100 thousand barrels per day of gasoline and blending components to meet the State's needs.

California's reformulated gasoline production capacity is expected to decline by nearly 5 percent when MTBE is phased out by December 31, 2002. MTBE is currently used at a concentration of nearly 10 percent by volume in California's gasoline. Although a portion of this volume will be replaced with ethanol (at a concentration of about 6 percent by volume), other gasoline blending components (such as pentanes) will have to be removed to ensure that the new reformulated gasoline (CaRFG Phase 3 RFG) is fully complying with the volatility and distillation properties. The use of ethanol in California's gasoline does not appreciably increase the volume of complying gasoline during the low volatility season (8 months). Since the loss of gasoline volume associated with the phaseout of MTBE cannot be entirely replaced with ethanol, California's gasoline import needs will grow regardless of the extent to which ethanol may be used in the State's gasoline. In other words, a mandate to use ethanol in California will not decrease the estimated volume of gasoline and blending components anticipated to be imported following the phaseout of MTBE.

The only potential exception to this conclusion is the possibility that blends of California Phase 3 RFG containing ethanol at a concentration of 10 volume percent could be utilized if modifications to the Predictive Model developed by the California Air Resources Board (CARB) were undertaken and completed. The current version of the Phase 3 RFG Predictive Model indicates that blends of Phase 3 RFG containing ethanol at concentrations greater than 6 percent by volume will increase emissions of oxides of nitrogen (NO_x), a precursor to the formation of smog. Various stakeholders have made claims that the inclusion of new vehicle testing data will allow modifications to this Predictive Model such that gasoline blends of higher ethanol concentrations will not increase NO_x emissions. This is an issue beyond the scope of the Pipeline Study. The potential merits of these claims would have to be verified and quantified by CARB before any refinery modeling work could be conducted by the Energy Commission to determine if there would be any potential gasoline supply implications.

Conclusion: Following the phaseout of MTBE, California's demand for imported gasoline and blending components will grow substantially. Initial estimates are that an additional 56 TBD of gasoline and blending components will need to be imported to California. If demand is slightly higher than forecast, refinery production decline is greater than expected and refinery creep (minor expansions associated with some refinery turnaround projects) is less than the anticipated 1 percent per year growth rate, additional imports could top nearly 100 TBD. The upper range of additional imports could be a sufficient volume to justify the construction of a pipeline between Texas and California, if adequate surplus supplies are available in this region.

Adequacy of US Gulf Coast Supply

The Energy Commission contracted the services of Drew Laughlin to investigate the potential supply availability of gasoline and blending components suitable to meet California's more stringent fuel specifications. This study, *Supply Potential for Petroleum Products in the US Gulf Coast*, should be reviewed to obtain a more thorough description of this subject matter.

In particular, California refiners will seek blending components that are high in octane and low in sulfur, distillation, and volatility. One such type of blending component is known as alkylate. Pure alkylate is called iso-octane. Currently, there are no producers of on-purpose iso-octane in the Gulf Coast. Rather, most alkylate is produced using a variety of feedstocks that create a mixture of various alkylate blends. The type of mixed alkylates produced in the Gulf Coast have distillation properties that are less desirable for use in California gasoline. Certain modifications would have to be made to segregate types of alkylate more suitable for California's needs, but these modifications have not yet been initiated. Gulf Coast refiners are also unwilling to make the necessary modifications until certain off-take agreements are in place or a sustained market is perceived for these segregated alkylates over a sustained period of time. The contractor concludes that alkylates of sufficient quality and surplus volumes are unlikely to be available to meet California's import demand following the phaseout of MTBE.

Few refiners in Texas are capable of producing reformulated gasoline to meet California's fuel specifications. Over the last couple of years, marine shipments of reformulated gasoline and blending components from Texas to California have only amounted to an average of 10 to 15 TBD. Although it is reasonable to assume that a greater number of refiners will be in a better position to produce California RFG after making modifications to comply with federal low sulfur gasoline standards that begin in 2004, it is unlikely that they will be able to supply at least 100 TBD. It is also likely that overall gasoline production capacity will decline in the US Gulf Coast as some companies make determinations that upgrading their facilities to comply with lower sulfur standards will not be economically viable. Demand for gasoline is also estimated to continue increasing. Both of these factors are likely to diminish availability of surplus gasoline that complies with California's stricter fuel quality standards.

Staff believes that gasoline and blending components of suitable quality for use in California's gasoline will also be available from other regions of the world, besides the USGC. For example, imports of reformulated gasoline and blending components averaged a little more than 30 TBD during 2001. This quantity is nearly double the volume transported from the Gulf Coast to California. After the phaseout of MTBE, the majority of foreign refiners capable of producing California reformulated gasoline is expected to decline. The primary reason is that these facilities will be unable to produce the base gasoline that will be used to blend with ethanol. Even so, Staff believes that blending components will become available from foreign sources if California prices rise to sufficient levels to attract these supplies from their current or alternative markets. In addition, these components could probably be transported to California for less cost than that of components from the Gulf Coast (primarily due to more favorable shipping economics).

Other petroleum products could be produced in the USGC for shipment to California, such as diesel fuel. Modifications to comply with 2006 federal low sulfur diesel fuel standards should increase the number of Texas refiners who would be capable of producing California's more

stringent low aromatic diesel fuel. Therefore additional sources of supply could become available if the pipeline project completion date was on or after 2006.

Conclusion: There does not appear to be adequate supplies of gasoline blending components of sufficient quality available in the Gulf Coast to provide the volumes necessary to merit construction of a pipeline. Even if additional supplies of diesel fuel could be made available in the Gulf Coast, California is not expected to become a large net importer of diesel fuel over the near term.

Pipeline Tariff Versus Marine Shipping Costs

The Energy Commission also contracted the services of Drew Laughlin to investigate the availability of domestic marine shipping assets that could be used to transport petroleum products between Texas and California. This study, *Marine Product Tanker Fundamentals, Economics and Outlook*, should be reviewed to obtain a more thorough description of this subject matter.

The US Jones Act requires that most commodities that are shipped from one domestic port to another be transported on US vessels. There were only 64 petroleum product tankers in the US fleet during 2001. Most of these vessels are in excess of 20 years old and 18 ships will be retired from service by 2006.

Several of these vessels are currently in service supplying petroleum products from Texas to Florida and New York Harbor. Although pipelines connect many of the Gulf Coast refineries with New York, there are no such pipeline connections to Florida. The contractor has estimated that 16 vessels would be required to transport 100 thousand barrels per day of gasoline and blending components to California from the Gulf Coast. Some of these ships are currently being used to transport MTBE from the USGC to California. Following the phaseout of MTBE, these ships could be used to transport gasoline and components from the USGC to California. But the quantity of MTBE being transported is less than 15 TBD, which means that changing service will only make available 2 ships to transport gasoline to California. The Contractor concludes that it is highly unlikely that 16 product tankers could be diverted to California service.

Utilization of Jones Act vessels is quite high and it is expected that demand for Jones Act vessels will continue to grow to meet increasing product demand in Florida and New York Harbor. Transportation rates on domestic product tankers are normally higher than the rates of foreign vessels traversing similar distances. In light of the rapid retirement schedule for Jones Act tankers and the increasing demand for their services, domestic shipping rates are not expected to decline in the near-term. This means that transportation costs from the USGC to California, which have ranged from 10 to 25 cents per gallon over the last couple of years, would probably be sustained at the higher levels. In fact, scarcity of product tankers coupled with higher demand should put upper pressure on these transportation rates over the near-term.

Conclusion: Shipping rates between Texas and California are expected to increase over the next several years as the fleet of domestic ships decline. It is therefore reasonable to assume that the tariff structure for the pipeline could be less than marine rates as long as the expected daily volume transported through the pipeline is at least 50 thousand barrels per day.

Conclusion:

A conceptual pipeline constructed between Texas and Southern California could be a beneficial source of additional fuel if adequate supplies of petroleum products could be made available in the Gulf Coast, demand for additional products in California can be sustained, alternative sources of supply (foreign and other domestic sources) are unavailable or at a higher cost, and transportation costs (tariffs) of the new pipeline are less than alternative forms of transportation (domestic marine vessels).

Unfortunately, adequate supplies of gasoline and blending components are not expected to be available in the Gulf Coast in volumes sufficient to justify the construction of a pipeline. However, there is another potential source of supply for California that could develop over the next several years if pipeline capacity between El Paso and the Phoenix/Tucson markets is expanded.

Alternative Route for Conceptual Pipeline

Interliance examined an alternative route for the conceptual pipeline to assess the possibility of using existing assets for a portion of the product pipeline. The purpose was to determine if capital resources and project timelines could be reduced. The former Four Corners crude oil pipeline between Long Beach and Needles, California was suggested as an alternative route for the conceptual pipeline. This pipeline has been purchased by Questar and could be used to deliver natural gas to California. Since Questar has not initiated a conversion project for this pipeline segment, it could become available for use as a conceptual product pipeline. Although Interliance concluded that the conversion of this line segment to transport petroleum products has the potential to reduce costs and shorten the construction schedule, they raised a number of issues that could preclude this alternative as a viable option.

Energy Commission staff agrees that the availability of the Questar segment depends on the strength of the natural gas import markets for Southern California. But concerns have been raised by the State Fire Marshal regarding the degree of rehabilitation required to make the line suitable for use as a product pipeline. Numerous leaks caused by external corrosion are cited as one concern. Staff also agrees that use of an existing pipeline that was constructed in 1959 could pose an environmental risk that would require significant additional investments to mitigate against product release.

Capacity Constraints from El Paso to Tucson

Increased product imports from Texas may be necessary to meet growing demand in the Southwest markets of New Mexico, Arizona, Nevada and California. Certainly the operation of the Longhorn pipeline will enable refiners in Texas to ship additional volumes of petroleum products to El Paso, Texas. Since the capacity of the Longhorn line is much greater than the demand in El Paso, additional volumes could be shipped to the Phoenix/Tucson markets as soon as the pipeline segment between these two locations is expanded. Continuation of this pipeline all the way to California would allow refiners in Texas a potentially economically attractive option to supply California with gasoline and other petroleum products.

Based on the capacity and throughput information described in the Interliance Report and industry meetings, the Kinder Morgan pipeline from El Paso to Tucson appears to be at capacity. The importance of this capacity constraint is that most or all increases in future demand for the Phoenix/Tucson marketing area must be met from deliveries that originate in Southern California. If this capacity constraint were removed by an expansion of the East Line, additional volumes of products could be shipped from the east which would provide an opportunity for refiners in Southern California to ship less gasoline to Arizona. This scenario is an example of how a pipeline expansion project outside of California can indirectly increase gasoline supplies for the State.

The potential for indirect supplies for California could be diminished somewhat by a number of factors such as decreased refinery capacity and capability in the El Paso region; gasoline specification changes for Arizona; and regional demand increases.

El Paso Refinery Capacity & Capability

Proponents of the Longhorn pipeline have surmised that gasoline and other petroleum products could be transported from the Gulf Coast to El Paso at a delivered price less than that of the prevailing El Paso market prices. If this is so, some local refinery capacity could be curtailed as soon as the Longhorn Pipeline begins deliveries to the El Paso market.

There are six refineries located in Western Texas and New Mexico. The refineries located in Western Texas are considerably larger than their counterparts in New Mexico and possess certain types of sophisticated process equipment that make it more likely that they will be able to continue producing some volumes of gasoline that could continue to be marketed in Arizona. But it is less likely that the smaller, less complex facilities in New Mexico will be able to remain as competitive with suppliers located in the Gulf Coast. Some portion of the refinery capacity in this region is expected to decline or find alternative markets outside the region. To the degree that some of these refinery capacity closures are permanent, less future capacity on the Longhorn Pipeline would be available to feed an expansion of the East Line capacity.

It is unknown at this time if the potential magnitude of this refinery capacity decline will be significant. Further, there has not been an assessment to determine the potential for refinery capacity upgrades to produce cleaner gasoline and blending components. Both of these issues, beyond the scope of this study, could impact the potential for indirect supply of gasoline and blending components for California.

Arizona Gasoline Specifications

Arizona gasoline (Arizona CBG) regulations allow shippers from the east and west to supply the Phoenix market with gasoline that is similar to Federal II RFG (Type 1 gasoline) or California Phase 2 RFG (Type 2 gasoline) specifications. The only stipulation is that Type 2 gasoline must be used during the winter months (November 1 through March 31) and contain ethanol at a concentration of 10 percent by volume. Furthermore, Arizona regulations require that MTBE be phased out of use 6 months following the phaseout date in California. Currently, the gasoline shipped to Phoenix during the summer months meets the less stringent Type 1 standards.

Following the phaseout of MTBE, gasoline shipped to Arizona during the summer months (April 1 through October 31) will no longer be allowed to contain MTBE. This means shippers will have to provide gasoline that contains ethanol or no oxygenates at all. If the gasoline is intended to contain ethanol, shippers will have to provide a base gasoline lower in volatility so that the finished gasoline will not exceed the 7.0 Rvp volatility standard after the ethanol is blended at the terminal. Since this type of gasoline is more difficult and expensive to produce, it is likely that refiners will produce non-oxygenated gasoline for the Phoenix market during the summer months.

If Arizona decides to modify their existing gasoline specifications to be identical or similar to California Phase 3 RFG standards on a year-round basis, the quality of gasoline will be cleaner and more difficult to produce. This scenario would decrease the number of refiners capable of meeting the more stringent specifications, potentially reducing the capability of refiners in the East to increase gasoline shipments to the Phoenix markets if the East Line capacity was expanded. Adoption of more stringent gasoline specifications for the Phoenix market would diminish the potential for East Line expansion to provide indirect supplies of gasoline and blending components for California.

Regional Demand Increases

Gasoline demand in Western Texas, New Mexico and Arizona is expected to continue growing at a rate equivalent to population growth, at least 2.5 percent per year. This continued growth equates to between 10 and 20 TBD of additional gasoline demand per year. The majority of this incremental demand is located in the Phoenix/Tucson markets and will have to be met with shipments from California because the East Line is at capacity. A portion of the shipments

through the Longhorn Pipeline, expected to be operational during the summer of 2002, is expected to be a source of new supply to help meet future demand in the West Texas and New Mexico markets. Although these volumes are modest, surplus capacity available from the Longhorn Pipeline that would be necessary to feed an expansion of the East Line capacity could be diminished by a significant delay of this expansion project.

Conclusion

Expansion of the East Line capacity between El Paso and Phoenix would provide the potential for indirect supplies of gasoline and blending components for California. Although the volume of indirect supply could be diminished by refinery closures, adoption of more stringent gasoline specifications for Arizona and regional demand increases in Western Texas and New Mexico.

New Pipeline to Las Vegas

Another potential source of indirect supply for California would be the construction of a new pipeline between Arizona and Las Vegas. Currently, Las Vegas receives the majority of its petroleum products via two pipelines from Southern California. Similar to the East Line expansion example, the construction of a new pipeline into Las Vegas from the east would provide the potential to decrease shipments from Southern California refineries.

Staff Findings and Recommendations

Staff Findings

(1) Construction of new pipeline between Texas and California

The construction of a new pipeline to be operated as a strategic fuel reserve (SFR) would be undesirable on both a cost and operational logistics basis, compared to a SFR designed to be dispersed at multiple terminals throughout the State.

The construction of a new pipeline to be operated as a supply source to initially fill a SFR would also be undesirable on both a cost and operational logistics basis, compared to a SFR designed to be dispersed at multiple terminals throughout the State.

Construction of a new pipeline between Texas and California could be a potentially new source of petroleum products for California. Texas already sends petroleum products to California on an intermittent basis by marine vessel. Any additional volumes in excess of these marine shipments would be considered "new" supply.

Following the phaseout of MTBE, California's demand for imported gasoline and blending components will grow substantially. Initial estimates are that imports will range between 50 and 100 thousand barrels per day. The upper range of these levels could be a sufficient volume to justify the construction of a pipeline between Texas and California, if adequate surplus supplies are available in this region.

There does not appear to be adequate supplies of gasoline blending components of sufficient quality available in the Gulf Coast to provide the volumes necessary to merit construction of a pipeline. Even if additional supplies of diesel fuel could be made available in the Gulf Coast, California is not expected to become a large net importer of diesel fuel over the near term.

Shipping rates between Texas and California are expected to increase over the next several years as the fleet of domestic ships decline. It is therefore reasonable to assume that the tariff structure for the pipeline could be less than marine rates as long as the expected daily volume transported through the pipeline is at least 50 thousand barrels per day

(2) Expansion of the East Line

Fuel specifications in the Phoenix gasoline markets are similar to California standards, requiring similar types of gasoline blending components that could also be used to create California reformulated gasoline.

Current gasoline demand in the Phoenix market is roughly 100 thousand barrels per day. Nearly 70 percent of this demand is supplied via pipeline from California refineries. The remaining demand is supplied via pipeline from refineries located in Western Texas over the East Line. Gasoline demand in the Phoenix market is expected to increase at a rate of 3 percent per year through 2010. The pipeline capacity on the East Line between Texas and Arizona is full.

If the pipeline capacity between Texas and Arizona is not expanded, all future demand in the Phoenix/Tucson markets must be met from supplies sent from the west. This development would require that California refiners ship increasingly larger volumes of gasoline to Arizona and/or import supplies from outside the State to service this additional demand. Additional volumes are estimated to be 13 thousand barrels per day by 2005 and 30 thousand barrels per day by 2010. These amounts are roughly equivalent to 1.3 to 3.0 percent of California's total gasoline demand.

Expansion of pipeline capacity between Texas and Arizona would increase the ability to supply the Phoenix/Tucson markets from the east. This development would provide an opportunity for California refiners to avoid increased shipments of gasoline from the west, indirectly increasing gasoline supplies for California. Although the volume of indirect supply could be diminished by refinery closures, adoption of more stringent gasoline specifications for Arizona and regional demand increases in Western Texas and New Mexico.

If expansion of the pipeline capacity between El Paso and Phoenix/Tucson markets was sufficient to handle all of the gasoline demand for this market, California refiners would have the ability to actually reduce shipments from the west from current levels, further increasing indirect gasoline supplies for the State.

Pipeline tariff rate differences, individual refinery capabilities, and alternative sources to optimally supply the various gasoline markets in the Southwest region are just some of the factors that determine how much gasoline would be shipped to the Phoenix/Tucson markets from California.

It is possible that shipments from the west could continue, even if expansion of the East Line were undertaken. This scenario seems unlikely, however, since commitments by shippers to send additional volumes from the east would probably be one of the conditions that would have to be met prior to financing and construction of the eastern expansion.

Conclusion: Expansion of the East Line is feasible and would result in the opportunity to indirectly increase reformulated gasoline supplies for California.

(3) New Pipeline to Las Vegas

California refineries are the primary source of petroleum products for the Las Vegas region. Gasoline shipments totaled nearly 50 thousand barrels per day during 2000.

Demand in Las Vegas is increasing at an annual rate of over 2 percent. Additional demand over the forecast period will have to be met from supplies originating in Southern California.

Gasoline specifications for the Las Vegas region are less stringent when compared to the standards for Phoenix and California. Some gasoline components that are difficult to blend in California gasoline are used to create complying gasoline for the Las Vegas markets.

If a new product pipeline were constructed between Las Vegas and the Phoenix/Tucson region, additional demand increases for the market could be supplied from refineries located in Texas. This assumes that the Longhorn pipeline is operational and that the pipeline capacity between El Paso and Phoenix has been increased to permit additional petroleum product shipments to Las Vegas.

Ability to supply Las Vegas from sources in Texas would enable California refiners the option to reduce deliveries of gasoline, indirectly increasing supplies of various blending components that could be used to produce California reformulated gasoline.

Staff Recommendations

California Energy Commission should support the completion of the Longhorn pipeline as a first step to enabling increased supply of gasoline and diesel fuel for California.

California Energy Commission should support expansion of the East Line capacity from El Paso to Phoenix.

California Energy Commission should also support the construction of a new product pipeline to Las Vegas from the east to enable petroleum product deliveries from Texas.

Further analysis should be conducted to better quantify the potential loss of refinery production capacity in Western Texas and New Mexico and the implications of such developments on the potential to indirectly increase gasoline supplies for California.

Further analysis should also be conducted to assess the impacts of Arizona adopting Phase 3 RFG and the implications on the potential to indirectly increase gasoline supplies for California.

California should not become an investor in a pipeline expansion project between El Paso and Phoenix or a new pipeline project between Arizona and Las Vegas. There appear to be a sufficient number of interested industry participants willing to provide capital to finance such a project.

Federal Government agencies who have lead permit authority for interstate petroleum pipeline projects (such as the Department of Transportation and the Environmental Protection Agency) should examine the feasibility of streamlining their review and approval process to reduce the time required to issue the necessary permits. Unreasonably lengthy permit processes are one of the main factors that endanger successful initiation of necessary energy projects.

Closing Remarks

Construction and operation of a petroleum product pipeline between Texas and California does not appear to be a viable option to increase gasoline and blending component supplies to California. The primary reason is a lack of surplus supply of quality components for producing Phase 3 RFG. Following the phaseout of MTBE, California's demand for imported gasoline and blending components will significantly increase by an additional 56 to 100 thousand barrels per day. It is likely that these supplies will be obtained from a variety of sources, primarily foreign in nature.

Expansion of pipeline capacity between Western Texas (El Paso) and the Phoenix/Tucson region would provide the potential to increase supplies of gasoline and blending components for California. Indirect supplies could become available if refiners located in Southern California decrease shipments of gasoline to Phoenix as a direct result of an expansion of the East Line. But there is no guarantee that these additional supplies will be freed up for use in California. Other mitigating factors such as refinery closures, adoption of more stringent gasoline specifications by Arizona and regional demand increases could decrease the potential to indirectly increase gasoline supplies for California.

Economic assistance should not be provided by California for these prospective projects. The Gulf Coast to California pipeline is not a viable project at this time and the expansion of the East Line capacity will occur as a result of growing regional demand and market opportunities provided by the operation of the Longhorn Pipeline.